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STATE OF MAINE
Department of Environmental Protection

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DEAN C. MARRIOTT
COMMISSIONER

April 17, 1990

Mr. Kenneth Marriott
Department of the Navy, Northern Division
Naval Facilities Engineering Command
Building 77-1
Philadelphia Naval Shipyard
Philadelphia, PA 19112-5094

Re: Naval Air Station Brunswick, Draft Phase I Feasibility Study Development and Screening of Alternatives, February 1990, by E.C. Jordan Co.

Dear Mr. Marriott:

The Maine Department of Environmental Protection (DEP) has completed its review of the Draft Phase I Feasibility Study Development and Screening of Alternatives, which was submitted to the DEP by E.C. Jordan CO on 2/16/90 on behalf of the U.S. Department of the Navy for the Naval Air Station Brunswick (NASB) Site. The DEP has the following comments:

General Comments:

In this draft document, E.C. Jordan has presented remediation alternatives based on information gathered during sampling rounds I to IV of the Remedial Investigation. This information has been used to develop human and environmental risk factors that allow for the selection of contaminants of concern, remediation target levels for these compounds, and the selection of appropriate remediation methods.

DEP comments on the Preliminary Risk Assessment raised concerns about the selection of contaminants of concern as well as the calculations used to develop risk levels. The final Risk Assessment was submitted for review and comment on 4/2/90. To properly evaluate the RI and Risk Assessment and apply that information to the review of the Draft Screening of Alternatives will be difficult. Consequently, the DEP's comments should be considered preliminary in nature. After proper review of the Remedial Investigation Report and the Final Risk Assessment the DEP may alter its position on some of the comments included in this letter.

Maine's ARAR's have been identified and will be forwarded to you in a separate correspondence.

Given the present available information, the DEP approves of the Draft Phase I Feasibility Study Development and Screening of Alternatives with the condition that the following comments are addressed and the Risk Assessment is approved.

Section 2, Identification of Remedial Action Objectives and General Response Actions

General comments:

A number of possible technologies are screened out based on the presence of buildings and utilities on site. The presence of buildings, roads and utilities located on source areas should be described and discussed in section 2.

Specific comments:

Page	Comment
2-2	The DEP concurs with the target additional cancer risk level of 10^{-5}, selected for NASB. This level corresponds to the highest acceptable risk outlined in the Maine Department of Human Services' Policy for Identifying and Assessing the Health Risks of Toxic Substances.
2-5	The basis for the source volume estimate at sites 1 and 3 as well as other sites must be provided.
2-8	The possibility of off site migration of groundwater beneath sites 1 and 3 has not been totally eliminated. While Mere Brook may act as a partial barrier, Round IV data indicates contamination in monitoring wells 229 and 230, south of Mere Brook. Reliance on Mere Brook to prevent off site groundwater migration is not advisable. The DEP acknowledges that NASB could be closed and eliminated as noted by E.C. Jordan Co. It is for this reason that the DEP requires that risk calculations be based on the assumption that future residential development is possible, on what is now NASB property.
2-9	National Interim Primary Drinking Water Regulations (NIPDWR) or Maximum Contaminant Levels (MCL's) were used to set target levels of listed compounds noted in groundwater. Maine Maximum Exposure Guideline (MEG) standards for arsenic, vinyl chloride and chromium are

more strict than levels quoted in table 2-1. The DEP requests that MEG standards be utilized whenever possible.

Some of the chemicals found in leachate, soil and sediment at sites 1, 2, and 3 bioaccumulate. The National Contingency Plan (NCP) specifies that characteristics of the waste, including the propensity to bioaccumulate, be identified.

2-10 In addition to mercury, iron, and zinc that are listed as environmental risks, cyanide and arsenic should be included. The DEP has not been presented with convincing evidence that cyanide and arsenic are not of concern.

Based on site history, a direct contact exposure at sites 1, 2, and 3 is a possibility.

2-12 Utilize MEG standards for arsenic, chromium, and vinyl chloride. Include arsenic and chromium as contaminants of leachate sediments.

2-15 The DEP has not had the opportunity to evaluate the final Environmental Risk Assessment, therefore it cannot, at this time, agree that mercury detected in the soils and leachate seeps at site 2 poses no environmental risk. It is unclear if the impact of mercury from site 2 combined with mercury from sites 1 and 3 has been properly considered. Discharge of mercury to Maine waters is prohibited by statute. The impact of mercury on the aquatic environment must be considered.

2-16 The DEP does not agree with the no-action ROD proposed for site 2 unless conclusive evidence is presented in the final risk assessment.

Did the food chain analysis projection include actual tissue analysis of aquatic and terrestrial organisms located in the Mere Brook habitat? The DEP is unaware of such sampling. NASB personnel referred to this type of analysis during the 2/21 town orientation meeting.

2-17 Sites 4, 11, and 13 show similar types of contamination. Additional site characterization at site 11 has been planned. Until this information is available, a decision to combine these sites for remediation purposes appears premature.

2-23 More information is needed to fill data gaps at Sites 11 and 13.

2-25 The DEP feels that MEG's represent suitable target levels and should be substituted for MCL levels listed for cadmium and tetrachloroethene in tables 2-4 and 2-5.

2-30 Address the potential for bioaccumulation of DDT found at Site 7.

2-31 Site 7 contains low levels of PAH's and DDT in the surface soils. The Risk Assessment has not been fully evaluated at this time. Site 7 was considered in the Preliminary Risk Assessment as one of three sites accessible to children. Therefore, the DEP does not agree, at the present time, with the no-action ROD proposed for site 7.

2-35 Provide a discussion of the sodium chloride/cyanide and the basis for attributing these contaminants to salt storage piles

2-36 The DEP can not effectively evaluate the target level of 18 ppm developed for PAH's at site 8 since the final risk assessment has not been fully evaluated. Since access to this site is not restricted and future development to this site can occur, the DEP believes that the PAH target level exceeds preferred levels.

2-38 Chromium should be added to table 2-6 and a target level established.

2-45 A target level of 3-4 ppm for carcinogenic PAH's has been proposed for site 9, an area designed for recreational purposes. The Maine DHS recommends a target level of 1ppm PAH in non-industrial areas.

2-46 The target level for vinyl chloride exceeds the state MEG.

2-47 It appears that the target levels for cPAH's established in the Summary of Public Health Risk Assessment for site 9 are being disregarded in section 2.6.4, Development of Recommended Action Alternatives for site 9. While remediation of stream sediments at this site may be impractical, remediation of the soils at site 9 will have to be considered.

2-49 Previously mentioned target levels for cPAH's have been omitted from table 2-8.

Section 3, Applicable or Relevant and Appropriate Requirements

3-4 RCRA Subpart F Groundwater Protection Standards (40 CFR 264.94) should refer to Alternate Concentration Limits in table 3-1.

3-7 In table 3-2 make the following substitutions:
Maine MEG for lead (revised 2/23/90) is 20 ppb
Maine MEG for 1,1-Dichloroethane (revised 2/23/90) is 5 ppb.

Section 4, Identification and Screening of Technologies

A number of technologies have been eliminated in section 4 without adequate explanation in the discussion. The DEP assumes that the eliminations were made based on the experience, research and professional judgment of staff engineers at E.C. Jordan Co. The DEP would like to see a more complete rational for elimination of alternatives than was presented in this section. However, the DEP does feel that a good mix of technologies has been retained for development

tbl 4-1 Define what is meant by "volatile metals" and "non volatile metals".

Table 4-1 must be expanded to include a narrative description of each technology available. Commentary at this stage is unnecessary and judgement of each technology is more properly placed in table 4-2.

tbl 4-2 Rationale for eliminating sites must be consistent with site limiting and waste limiting characteristics. Rationale for screening technologies should be consistent between technologies. The presence of solid waste in landfills should be considered as a waste limiting factor.

Some technologies were eliminated prematurely from section 4, table 4-2 and should be retained for further consideration. Environmental monitoring of soils/sediments was eliminated because samples cannot be taken at certain sites. However, this action may be useful at other appropriate sites.

Land spreading and composting were eliminated for being ineffective on inorganics. This alternative could be considered on sites where inorganic contaminants are not an issue.

In-situ biological treatment of soils/sediments was eliminated due to high concentrations of heavy metals.

This treatment may be applicable on sites where heavy metals are not an issue.

Steam stripping of groundwater/leachate was eliminated due to energy requirements. Energy requirements for this method were not presented.

Pumping and biological treatment of groundwater/leachate was eliminated due to the presence of chlorinated organics and heavy metals. This appears inconsistent with the decision to retain in-situ biological treatment as an innovative process to treat PCE and TCE.

Section 5, Development of Remedial Action Alternatives

Since sites 1,2 and 3 are downgradient of other sites, the potential for one remedial alternative to affect another site must be considered.

5-2 As mentioned previously, sites 2 and 7 should not be eliminated for consideration for remediation based on information now available.

For any selected remediation that does not remove the source of the groundwater, leachate sediment and/or soil contamination a long term monitoring schedule, as well as deed restrictions must be considered.

5-6 Corrective Action Alternatives for sites 1 and 3 (table 5-1) do not address the impact of mercury in sediments, identified in section 2 (table 2-3). Remedial alternatives to address the sediment contamination at sites 1 and 3 need to be developed.

5-21 Corrective action alternatives for sites 4,11 and 13 (table 5-2) do not address the heavy metals targeted in section 2. If these soils are returned with the heavy metals intact, the groundwater treatment component will need to operate until natural leaching processes reduce their concentrations.

5-33 The alternatives presented for site 8 are sufficient to meet the remedial action objectives only if it is clearly demonstrated that contamination of the nearby Jordan Avenue Wellfield is not a possibility. If this cannot be shown through additional planned fieldwork, then the remedial alternatives suggested for site 8 must be redeveloped. None of the present alternatives will be adequate.

Section 6, Screening of Remedial Alternatives

6-20 Alternatives 1,3-A through E has been retained. Alternative 1,3-F has been eliminated, and with it the only source removal option. Disadvantages cited are the high cost of incineration, the cost and limited availability of UV/photolysis equipment, and the cost of sludge disposal. The DEP has no objection to the elimination of alternative 1,3-F, since a mix of effective alternatives are retained. However alternative 1,3-B makes no provision for groundwater and leachate remediation and will do little to reduce the environmental and human health risk. The DEP suggests that alternative 1,3-B should also be eliminated from further consideration.

All alternatives selected for sites 1 and 3 will require long term monitoring and deed restrictions if the source of the contamination is not removed.

6-33 The DEP questions the suitability of in-situ groundwater bioremediation of Alternative 4, 11, 13-D. It is the understanding of the DEP that bioremediation of heavily chlorinated compounds has not yet been accomplished except on a pilot scale. Research has shown that the first dechlorination of an unsaturated three or four chlorine molecule proceeds only under anaerobic conditions, with methane as a co-reactant. Vinyl chloride, a carcinogen, is the metabolite. Subsequent dechlorination steps proceed aerobically with more innocuous metabolites. The Section 5 discussion of in-situ bioremediation recognizes this. To biologically degrade Sites 4, 11, & 13 compounds will require precise control of oxidative/reductive soil conditions as well as hydrologic control of groundwater flows, to insure the problem is not being compounded. This process would be difficult enough to implement in series aboveground reactors, where temperature, oxygen, nutrients and contact time can be easily manipulated. It is unrealistic to expect it to succeed as an in-situ batch process, where aerobic and anaerobic conditions must be alternated and different soil organisms must be raised to effective populations at different times. A different groundwater treatment technology, such as Air Stripping/GAC Adsorption, should be coupled with Thermal Soil Aeration to make alternative 4, 11, 13-D viable.

6-44 Site 11 has not been fully characterized and the extent of source areas for sites 11 and 13 have not been accurately calculated. At the present time, the DEP believes it is premature to combine sites 4,11 and 13 for remediation.

6-48 Describe what is meant by "soil cover" in alternative 8-B. Placement of six inches of loam, subject to infiltration and erosion, is not an adequate closure. However, two feet of cover, or a thinner but low permeability cap might be adequate.

6-52 Alternative 8-D is a good candidate for detailed analysis as presented.

6-61 As previously mentioned, the DEP disagrees with the target level for cPAH's set for site 8. Remedial alternative 8-B, as presented, would do nothing to reduce the toxicity of contaminants or permeability of this site and could very likely require additional remediation. The DEP prefers to undertake a remedial action that would reduce the toxicity of the site.

6-64 Alternative 9-B places a low permeability cap over the site. This alternative will be insufficient without a provision for groundwater treatment. The DEP believes that alternative 9-B should be eliminated.

6-66 Alternative 9-C involving thermal soil aeration of the source soils may also require short-term groundwater treatment.

6-69 Rejection of alternative 9-D is inconsistent with the retention of this type of remediation at sites 4, 11, and 13.

6-81 Alternative 9-B does nothing to reduce the toxicity of contaminants on site or to remediate the contamination. Remedial action 9-B deserves no further consideration. If the source at site 9 is located, the DEP prefers to implement a remedial action that will involve both source removal and groundwater treatment to reduce the environmental impact and the potential for human risk.

Section 7, Treatability Study Recommendations

The Department has found that carbon absorption does not always remove organic contaminants in a cost effective manner and recommends the implementation of treatability studies.

Thank you for the opportunity to review this document. If you have any concerns or questions regarding these comments, please contact me at (207) 289-2651.

Sincerely,

Ted Wolfe

Ted Wolfe
Division of Licensing and Enforcement
Bureau of Oil and Hazardous Materials Control

cc: Meghan Cassidy, EPA
Cmdr. Geoffrey Cullison, NASB
Fred Lavalle, ME DEP
Denise Messier, ME DEP
Susan Weddle, Community Representative